CLAIMS

What is claimed is:

1. A fluorescence measuring device for a gemstone under test, said fluorescence measuring device comprising:

an ultraviolet ("UV") radiation source configured to provide trans-radiation and direct radiation to the gemstone under test; and

a light detector positioned proximate the gemstone under test, said light detector being configured to detect visible light emitted from the gemstone under test in reaction to UV radiation applied to the gemstone under test.

2. A fluorescence measuring device according to claim 1, wherein said UV radiation source comprises a plurality of light emitting diodes ("LEDs").

3. A fluorescence measuring device according to claim 2, wherein said plurality of LEDs comprises an upper LED that emits UV radiation along an emission axis and a lower LED that emits UV radiation along said emission axis.

4. A fluorescence measuring device according to claim 3, wherein:

said upper LED emits UV radiation toward said lower LED; and

said lower LED emits UV radiation toward said upper LED.

5. A fluorescence measuring device according to claim 3, wherein said lower LED includes a mounting surface configured to accommodate the gemstone under test.

6. A fluorescence measuring device according to claim 5, wherein said mounting surface is configured to accommodate the gemstone under test in a table-down position.

7. A fluorescence measuring device according to claim 2, further comprising a user interface element for adjusting the output power of said plurality of LEDs.

8. A fluorescence measuring device according to claim 7, wherein said user interface element controls the current applied to said plurality of LEDs.

9. A fluorescence measuring device according to claim 1, wherein said light detector is configured such that its spectral response simulates the spectral response of the human eye.

10. A radiation subsystem for use with a gemstone fluorescence measuring device, said radiation subsystem comprising:

an upper ultraviolet ("UV") radiation source that emits UV radiation along an emission axis;

a lower UV radiation source that emits UV radiation along said emission axis; and

a mounting surface, located between said upper UV radiation source and said lower UV radiation source, configured to accommodate a gemstone under test.

11. A radiation subsystem according to claim 10, wherein said upper UV radiation source and said lower UV radiation source are configured to provide trans-radiation and direct radiation to the gemstone under test.

12. A radiation subsystem according to claim 10, wherein:

said upper UV radiation source comprises a first light emitting diode ("LED"); and

said lower UV radiation source comprises a second LED.

13. A radiation subsystem according to claim 10, wherein:

said upper UV radiation source emits UV radiation toward said lower UV radiation source; and

said lower UV radiation source emits UV radiation toward said upper UV radiation source.

14. A radiation subsystem according to claim 10, wherein said lower UV radiation source forms said mounting surface.

15. A radiation subsystem according to claim 10, further comprising a user interface element for adjusting the output power of said upper UV radiation source and said lower UV radiation source.

16. A fluorescence measurement method for gemstones, said method comprising:

radiating a gemstone under test with ultraviolet ("UV") radiation from both above and below the gemstone under test;

detecting visible light emitted from the gemstone under test in reaction to UV radiation applied to the gemstone under test, resulting in a detected visible light measurement; and

grading fluorescence of the gemstone under test based upon the detected visible light measurement.

17. A method according to claim 16, wherein said radiating step radiates the gemstone under test with a UV radiation source that provides trans-radiation and direct radiation to the gemstone under test.

18. A method according to claim 16, wherein said radiating step comprises:

emitting UV radiation from an upper light emitting diode ("LED") along an emission axis; and

emitting UV radiation from a lower LED along said emission axis.

19. A method according to claim 18, wherein:
said upper LED emits UV radiation toward said lower LED; and
said lower LED emits UV radiation toward said upper LED.